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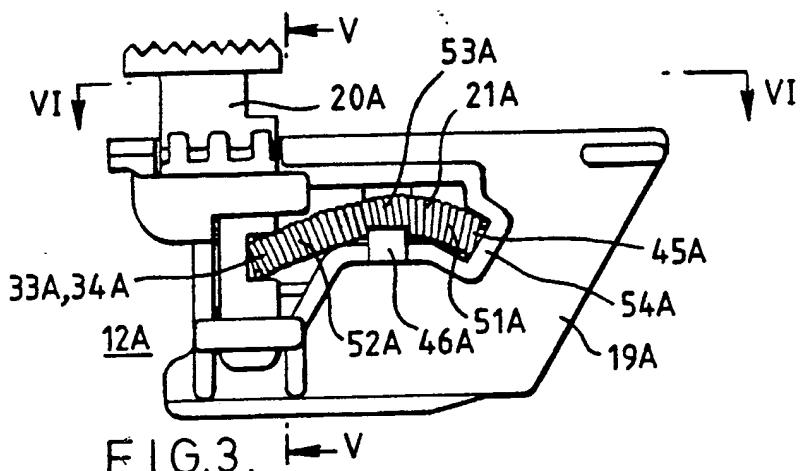
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(54) Blade-carriers for retractable bladeknives

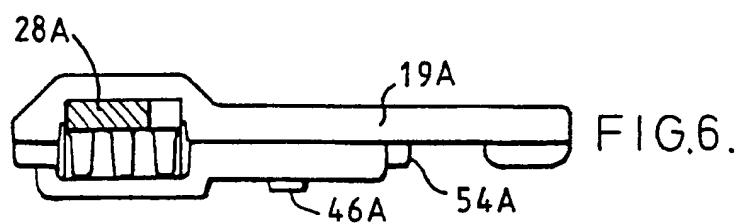
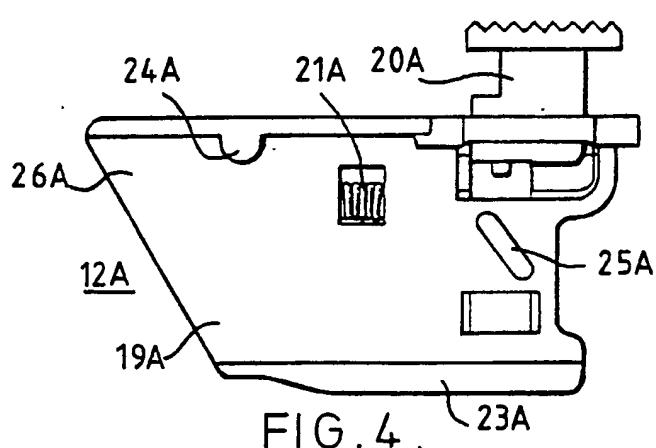
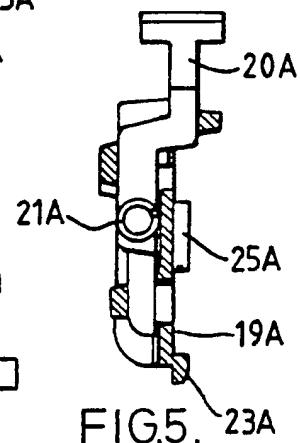
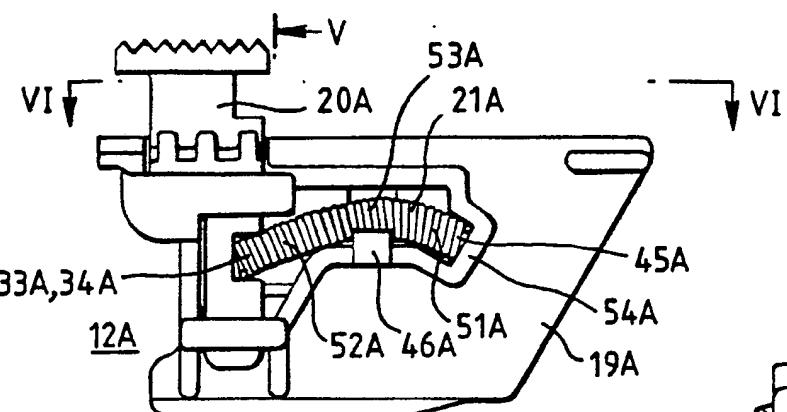
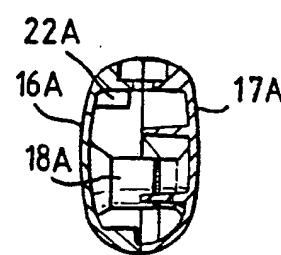
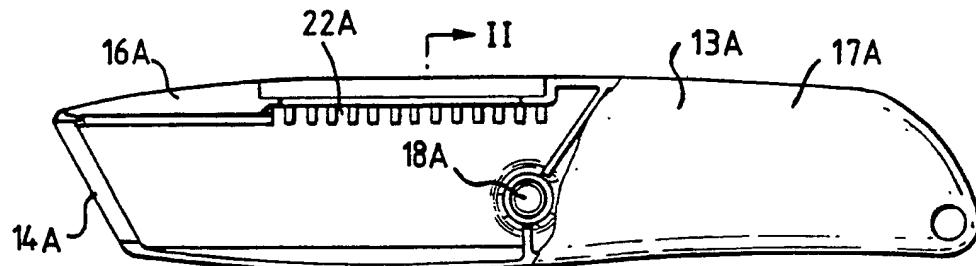
(57) A blade-carrier 12A for a retractable blade knife (11A Fig 1) has a close-coiled helical tension spring 21A arranged to act in a cantilever fashion, on a button member 20A to move teeth (32B, Fig 12b) into interlocking engagement with teeth (22A, Fig 1) on the knife handle, to lock the blade-carrier in selected position.



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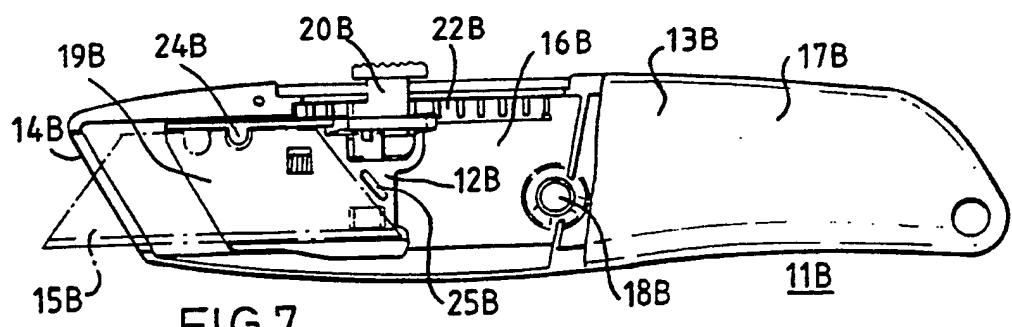


FIG. 7.

FIG. 8.

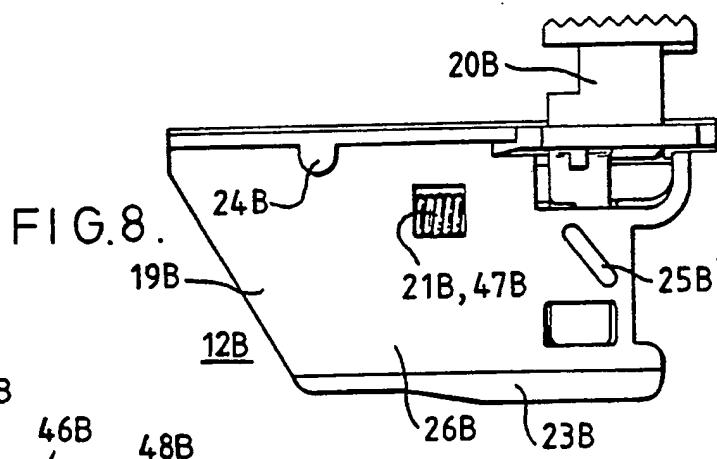


FIG. 9.

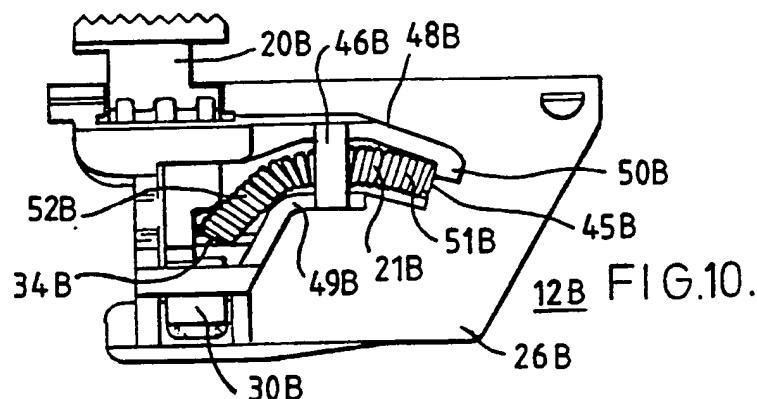
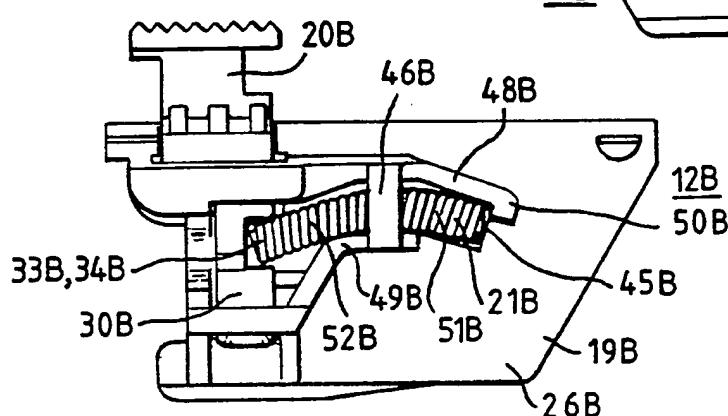
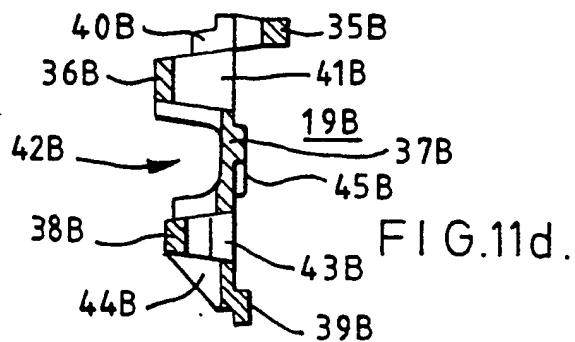
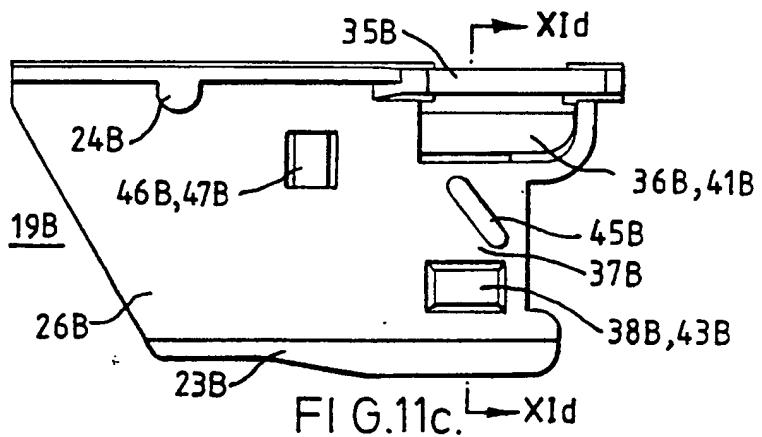
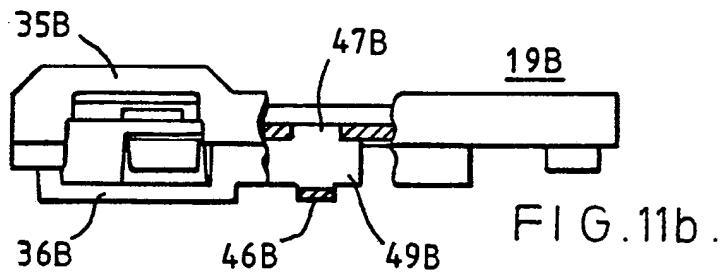
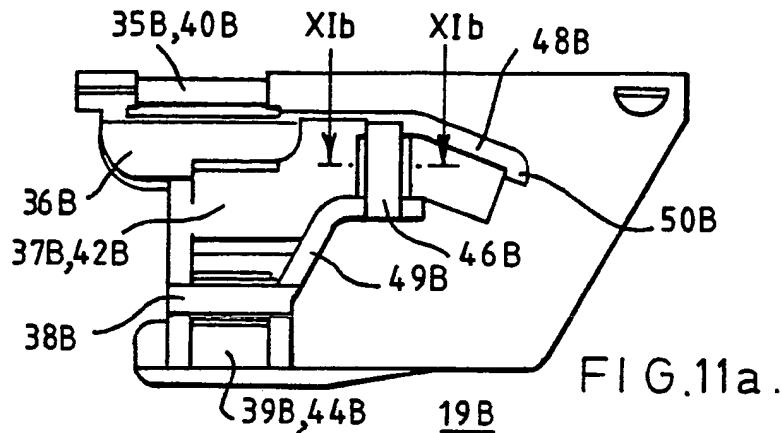


FIG. 10.

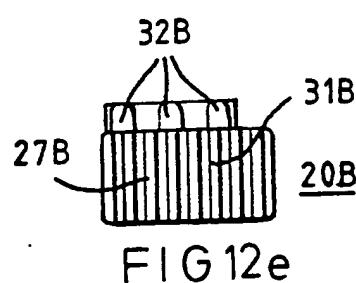
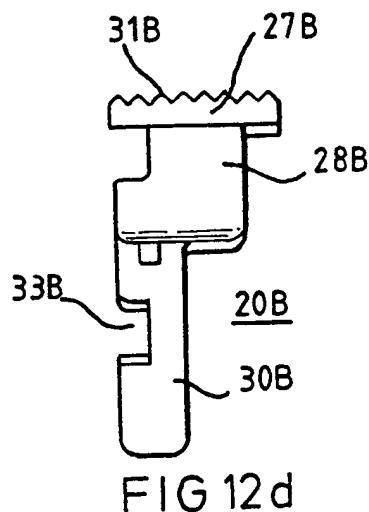
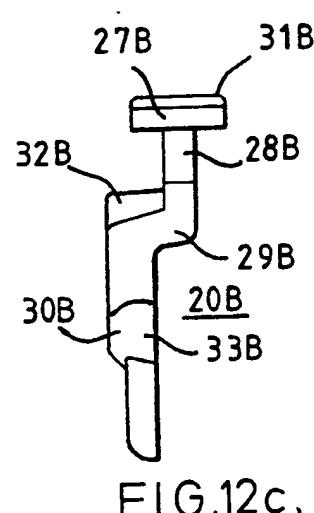
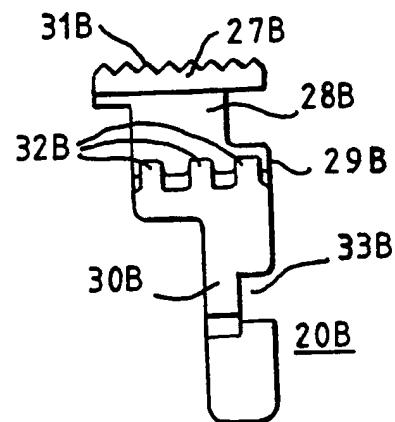
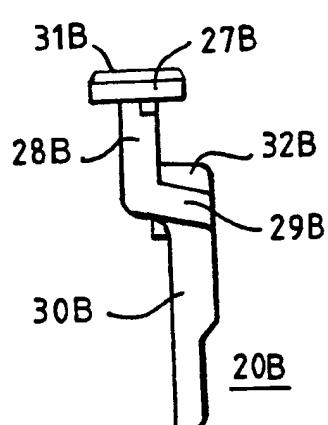
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"Blade-Carriers For Retractable-Blade Knives"

This invention relates to blade-carriers for retractable-blade knives, of a type in which a blade-carrier is housed in an elongate handle for longitudinal sliding movement along the handle for extending and retracting, at one end of the handle, a blade carried by the blade-carrier, which has a spring-biased manually releasable detent for locking the blade-carrier and hence the blade, in a desired extended, or retracted, position.

Known blade-carriers for knives of this type commonly comprise a body to carry the blade, a manually-operable button member movably mounted in or on the said body and a spring acting between the body and the button member for biasing a detent on the button member into engagement with a co-operating part of the handle.

If the spring is a helical compression spring, it has to be compressed in order to be fitted to the body and the button member of the blade-carrier upon initial assembly thereof. This causes inconvenience and even difficulty for manufacture, especially automatic

assembly by machine of the blade-carrier.

A further problem with helical compression springs, because they are open-coiled, is their great tendency to become tangled together, further exacerbating the problem of manufacturing blade-carriers with helical compression springs.

Cantilever-type leaf springs can be used instead, with one end portion of the spring held in the body of the blade-carrier and an opposite end engaging the button member, but the leaf spring has to be very long to achieve the necessary deflection for the required displacement of the button member.

It is an object of the invention to overcome these drawbacks by providing a blade-holder with a spring which is neither an open-coiled helical compression spring, nor a leaf spring.

According to the invention, there is provided a blade-carrier as claimed in each of claims 1 to 8, a kit of parts as claimed in claim 9 and a retractable-blade knife as claimed in claim 10.

The invention will be described by way of examples with reference to the drawings, wherein Figs. 1 to 6

illustrate a first embodiment of the invention and Figs. 7 to 12 illustrate a second embodiment of the invention.

Fig. 1 is a partly broken away side elevation of the elongate handle of a first retractable blade knife embodying the invention and Fig. 2 is a section on II-II in Fig. 1;

Fig. 3 and 4 are enlarged opposite side elevations of the blade-carrier of the first embodiment;

Figs. 5 and 6 respectively are sections on V-V and VI-VI of Fig. 3;

Fig. 7 is a partly broken away side elevation of a second retractable blade knife embodying the invention;

Figs. 8 and 9 are enlarged opposite side elevations of the blade-carrier of the second embodiment (as in Fig. 7);

Fig. 10 corresponds to Fig. 9 but shows the button member depressed;

Figs. 11a to 11d (referred to collectively as "Fig. 11") illustrate the body of the blade-carrier, Fig. 11a being a side elevation, Fig. 11b a plan view combined

with a section on XIb-XIb of Fig. 11a, Fig. 11c being an opposite side elevation and Fig. 11d a section on XIc-XIc of Fig. 11c; and

Figs. 12a to 12e (referred to collectively as "Figs. 12") illustrate the button member of the blade-carrier, Figs. 12a and 12d being respectively rear end, right side, front end and left side elevations and Fig. 12e being a plan view.

Corresponding references in Figs. 1 to 6 on the one hand and Figs. 7 to 12 on the other hand refer to corresponding parts or features, but distinguished by suffix "A" in Figs. 1 to 6 and suffix "B" in Figs. 7 to 12. It should be understood that both embodiments are identical except where the contrary is indicated.

Referring both to Figs. 1 to 6 and to Figs. 7 to 12, a retractable blade knife 11 (not shown in its entirety in Figs 1 to 6) comprises a blade-carrier 12 and an elongate handle 13 in which the blade-carrier 12 is housed for longitudinal sliding movement along the handle 13 for extending and retracting, at one end 14 of the handle 13, a blade 15 (not shown in Fig. 1 to 6) carried by the blade-carrier 12.

As is conventional, the handle 13 is in two elongate

"halves", namely, a left-hand "half" 16 and a right-hand "half" 17, not identical, secured together by a screw 18.

The blade-carrier 12 comprises a one-piece, die-cast, body 19 for supporting the blade 15, a die-cast button member 20 slidably mounted in the body 19, to slide laterally of the handle 13, and a spring 21 for biasing the button member 20 upwardly as seen in the drawings relative to the body 19 into interlocking engagement with teeth 22 in the handle 13. (The exact number of teeth 22 is unimportant.)

The manner in which the body 19 supports the blade 15 is conventional, namely, by means of a bottom ledge 23, an upper detent 24 and a rear abutment 25, all integral with a platform 26.

Referring to Fig. 12, that is, Figs. 12a to 12e, the button member 20 is die-cast and comprises a button 27 at the top and an upper stem 28 depending from the button 27. As seen in Fig. 12a, looking at the rear of button member 20, from the bottom of the upper stem 28 there projects rightwardly a horizontal portion 29, from which a lower stem 30 depends, so that the lower stem 30 is offset to the right of the upper stem 28. The lower stem 30 is also forwardly offset from the upper stem 28. The button 27 has conventional serrations 31 on its

upper surface. Three detent teeth 32 project upwardly from the top of horizontal portion 29 (on the right of upper stem 28 and above lower stem 30) to engage the teeth 22, which are formed in the right-hand handle "half" 17. Approximately half-way down the back of the lower stem 30 is a recess 33 to receive the front end 34 of the spring 21.

Referring to Fig. 11, that is, Figs. 11a to 11d, as well as to Figs. 8 to 10, the button member 20 is vertically slidably mounted in the body 19. The body 19 is formed:- a) at the top with a portion 35 engaging the left-hand side of upper stem 28; b) slightly lower down, and on the opposite side, with a portion 36 engaging the right-hand sides of portion 29 and of the top end of lower stem 30; c) lower down still, with a portion 37 engaging the left-hand side of the lower stem 30; d) lower down still, with a portion 38 engaging the right-hand side of the lower stem 30; and e) at the bottom with a portion 39 engaging the left-hand side of the lower stem 30. Lateral openings 40 to 44, opposite the inside surfaces (that is to say, the button member-engaging surfaces) of body portions 35 to 39, provide access for die portions (not shown) for the die-casting of the body 19.

The spring 21 is a close-coiled tension spring which

is close-coiled from end 34 to its opposite end 45. That is to say, unlike a conventional tension spring, not shown, the spring 21 has no special end formations but, on the contrary, its coils extend to the extreme ends 34, 45. Because of the closeness of the coiling and the absence of special end formations, there is no tendency for a collection of many such springs (for assembly into knives in a production line, whether manual or automatic) to become entangled with each other.

As thus far described, the first embodiment of Figs. 1 to 6 and the second embodiment of Figs. 7 to 12 are substantially identical.

In the case of the second embodiment only, see Figs. 8 to 12, the body 19B completely surrounds the spring 21B intermediate the ends 34B, 45B of the spring, so that the spring has to be "fed" longitudinally of itself into position in the body 19B. More particularly, body 19B has a portion 46B on the outside of spring 21B on the right-hand side. Apart from an aperture 47B opposite portion 46B (to facilitate the die-casting) the body 19B extends along the whole of the outside of spring 21B on the left-hand side. Upper and lower ledges 48B, 49B are integrally joined to the platform 26B and portion 46B of body 19B and receive the spring 21B between them, so that the spring 21B is completely

encircled between its ends 34B, 45B by the body 19B.

If the button member 20B has not been inserted already, the spring 21B can be inserted, with end 45B leading, from left to right in Figs. 9 and 11a, until the end 45B comes to abut a lip 50B on the upper ledge 48B.

Regardless of whether, or not, button member 20B has been inserted already, the spring 21B can be inserted, with end 34B leading, from right to left in Figs. 9 and 11a, until spring end 45B comes into place under the lip 50B. If button member 20B has already been inserted beforehand, it requires little or no additional manipulation to make spring end 34B enter recess 33B in button member 20B, apart from the necessary manipulation for inserting the spring in any case.

If the button member 20B is inserted after the spring 21B, the bottom end of lower stem 30 pushes the spring end 34B aside until the latter snaps into the recess 33B.

When the blade-carrier 12B has been thus assembled, the right-hand end portion 51B, adjacent spring end 45B, is held by the body 19B, particularly by body portion 46B, upper and lower ledges 48B, 49B, including lip 50B.

and the platform 26B. The left-hand end portion 52B, adjacent spring end 34B, engages in recess 33B in button member 20B and operates at least substantially as a cantilever spring for the biasing of the button member 20B.

The above description of the second embodiment of Figs. 7 to 12 applies equally to the first embodiment of Figs. 1 to 6, except as follows:-

the body portion 46A has an opening 53A which permits the spring 21A to be "fed" laterally of itself into position in the body 19A; and

an end ledge 54A integrally joins the upper and lower ledges 48A, 49A, so that it is virtually impossible to feed the spring 21A (from right to left in Fig. 3) with spring end 34A leading.

Lateral feeding of spring 21A is possible before or after insertion of button member 20A, but longitudinal feeding (left to right in Fig. 3) has to be done before insertion of button member 20A.

CLAIMS

1. A blade-carrier (12) adapted for incorporation in a retractable blade knife (11) of a type having an elongate handle (13) along which the blade-carrier (12) can be moved for extending and retracting a blade (15) at one end (14) of the handle (13), the blade-carrier (12) comprising a body (19) which is formed for supporting the blade (15), a button member (20) slidably mounted in the body (19) and a spring (21) for biasing the button member (20) laterally of the handle (13) into interlocking engagement with a part (22) of the handle (13) for locking the blade-carrier (12) and hence the blade (15) in a selected position, the blade-carrier position being releasable and changeable by manual operation of the button member (20), characterised in that the spring (21) is a substantially close-coiled helical tension spring of which one end portion (51) is held by the body and an opposite end portion (52) engages the button member (20) and operates at least substantially as a cantilever spring for the biasing of the button member (20).
2. A blade-carrier (12B) as claimed in claim 1, wherein the body (19B) completely encircles a portion of the

spring (21B) intermediate the ends of the spring (21B).

3. A blade-carrier as claimed in claim 2 wherein the body (19B) is adapted to enable the spring (21B) to be fed selectively either end portion (51B, 52B) first into position relative to the body (19B).

4. A blade-carrier (12A) as claimed in claim 1 wherein a portion (46A) of the body (19A) partly encircles the spring (21A) intermediate the ends of the spring (21A) to enable the spring (21A) to be moved laterally of itself into position therein.

5. A blade-carrier (12) as claimed in claim 1, 2 or 4 wherein the button member (20) can be assembled with the body (19) before the spring (21) is mounted thereto.

6. A blade-carrier (12) as claimed in claim 3 wherein the button member (20) can be assembled with the body (19) before the spring (21) is mounted thereto but prevents the insertion of the spring (21) in one of the two possible directions.

7. A blade-carrier (12) as claimed in any preceding claim wherein the button member (20) can be assembled with the body (19) after the spring (21) is mounted thereto, a part (30) of the button member (20) engaging

and deflecting and moving past said opposite end portion (52) of the spring (21).

8. A blade-carrier (12) as claimed in any preceding claim wherein the spring (21) is substantially close-coiled from end (34) to end (45) and is without special end-pieces.

9. A kit of parts comprising a body (19), a button member (20) and a spring (21) adapted for assembly into a blade-carrier (12) as claimed in any one of claims 1 to 8.

10. A retractable blade knife (11) comprising a blade-carrier (12) as claimed in any one of claims 1 to 8 and an elongate handle (13) along which the blade-carrier (12) can be moved for extending and retracting a blade (15) at one end (14) of the handle (13).